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MISCELLANEOUS REPORT NO. 28

THE FOREST INSECT SITUATION IN THE LAKE STATES IN 1953

By L. C. Beckwith and H. J. MacAloney, Entomologists

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Lake States Forest Experiment Station

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Miscellaneous Report No. 28

THE FOREST INSECT SITUATION IN THE LAKE STATES IN 1953

By L.C. Beckwith and H. J. MacAloney [1]
Lake States Forest Experiment Station [2]

Forest production can be maintained at high levels only if forest stands are protected from enemies. Protection from fire has long been a major activity of forestry agencies in the Lake States. However, the need for protection from the widespread damage of insect pests has only recently received coordinated regional effort. A first step has been the initiation of surveys to determine the current and probable damage from important forest insect pests.

PAST SURVEYS

The Forest Pest Control Act of 1947 authorized cooperative surveys of forest pests. Such surveys were begun in 1949 in the Lake States by the Milwaukee Forest Insect Laboratory of the U. S. Bureau of Entomology and Plant Quarantine (now the Forest Insect Research Division of the Lake States Forest Experiment Station) in cooperation with other agencies, and, have been repeated annually since that time.

Before 1949 there had been a number of forest pest surveys in the Lake States, but not on a coordinated regional basis. Since then local surveys have continued and new ones have been initiated. For example, (1) the Forest Insect Laboratory at Milwaukee had conducted a number of surveys before 1949, (2) the North Central Region of the U. S. Forest Service for several years compiled an annual report of forest insect conditions on national forest lands, (3) the University of Minnesota, in cooperation with the State Conservation Department, has reported on forest pests in Minnesota for at least a decade, (4) in Wisconsin the State Entomologist has compiled annual reports, and in addition in recent years the Conservation Department has developed a full scale detection survey, which is the basis for an annual report on forest insect conditions in the state, and (5) the Michigan Conservation Department in cooperation with the University of Michigan and Michigan State College, in 1950 began reporting forest pest occurrence and damage intensity within the State. The initiation of the regional survey made it possible to integrate the information from all these agencies into one report and to cover areas not previously surveyed.

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[1] Entomologist and entomologist in charge, Forest Insect Research Division, Milwaukee, Wis. The authors have assembled this report from information submitted by the cooperating agencies listed on page 2.

[2] Maintained at St. Paul 1, Minnesota by the U. S. Dept. of Agriculture, Forest Service, in cooperation with the University of Minnesota.

THE 1953 SURVEY

During 1953 the Division of Forest Insect Research, Lake States Forest Experiment Station, obtained research and survey information on forest insects in the Lake States from the following cooperating agencies:

Minnesota:	Office of the State Entomologist Department of Conservation University of Minnesota
Wisconsin:	Office of the State Entomologist Conservation Department University of Wisconsin
Michigan:	Department of Conservation University of Michigan Michigan State College
Industry:	William Bonifas Lumber Company
U. S. Government:	Department of the Interior Office of Indian Affairs
	Department of Agriculture U. S. Forest Service

This information was assembled and developed into the following report.

The more important species reported in 1953 are discussed in some detail; those of less importance are given brief mention. Insect species that have caused heavy damage in the past, even though not reported in 1953, are included to emphasize their potential importance, so that if any evidence of their presence should be found, it can be called to the attention of one of the above agencies.

JACK-PINE BUDWORM - Choristoneura pinus Free.

The jack-pine budworm has been an important pest in the Lake States for the last 30 years. Although not as damaging as is the spruce budworm, Choristoneura fumiferana (Clem.), in the spruce-fir types, some mortality, top kill, and loss of increment has occurred. Surveys in lower Michigan indicated there was an average cordwood loss of about three percent in pole-size stands in 1951 and in 1952. Losses of saplings and reproduction also occurred. The infestation declined and no additional loss occurred in the northern half of the Lower Peninsula in 1953, especially in Roscommon, Ogemaw, Crawford, Kalkaska and Grand Traverse Counties, which had previously been heavily infested. The highest remaining populations in the Lower Peninsula are in Montmorency and Presque Isle Counties, where heavy defoliation continued. In the Upper Peninsula, the outbreak increased to severe proportions during 1953 in Luce County, where surveys (conducted during April, May, and June) revealed that the insect was in outbreak stages over 6,000 acres of jack pine of various ages and stand densities and had caused heavy defoliation on at least 4,000 acres of this area. The infestation in Delta County is at a low level. A new outbreak has appeared in western Chippewa County within the Marquette National Forest.

In Wisconsin, infestations have been very light. The greatest potential danger appears to be in Douglas and Washburn Counties. The insect is also present in Burnett County.

Several unconfirmed reports of the budworm's presence in Minnesota have been received. A single confirmed specimen was collected at Bena, Minnesota.

LARCH SAWFLY - Pristiphora erichsonii (Htg.)

The larch sawfly has caused a large amount of damage in the Lake States in the past. In 1953 this insect continued in outbreak proportions in northern Minnesota where it has been increasing annually since 1945. Aerial surveys since 1951 show that the total area of complete defoliation is increasing in size and shifting northward. In 1953, approximately 255,000 acres suffered complete defoliation as compared to about 149,000 acres during 1952. The average defoliation throughout the northern part of the state as a whole, based on ground surveys, was 84 percent as compared to 57 and 71 percent in 1951 and 1952, respectively. In general, most areas to the north of U. S. Highway 2 suffered partial to complete defoliation in 1953.

Tree mortality that could be attributed directly to the sawfly has not been observed. Attacks by the eastern larch beetle, Dendroctonus simplex Lec., have hastened the death of some tamaracks on various areas, following inundation, deterioration of the site, or cutting operations.

In the Upper Peninsula of Michigan, the sawfly was more abundant in 1953 than in previous years, although no serious defoliation occurred. Small populations were present throughout the peninsula, with the heaviest infestations in Baraga and Houghton Counties. The sawfly was also found in four tamarack sites in Manistee County in the Lower Peninsula. This represents the first report of the sawfly in this section of the state in recent years.

The larch sawfly was reported from most of the range of its host in Wisconsin except for the northeastern part of the state. There was a slight increase in populations over those reported in 1952, but defoliation still remained very light.

PINE SAWFLIES

Sawfly populations are generally increasing in the Lake States and it is expected that this trend will continue. Control operations were not conducted in 1953, but plantations should be watched closely in the future to follow the progress of the build-up and the possibilities of anticipating damage as well as to determine needs for control.

Red-headed Pine Sawfly - Neodiprion lecontei (Fitch)

In general, the insect was more widespread over the Lake States in 1953 than in 1952. Increased activity was reported from Michigan, especially in the Upper Peninsula where the greatest concentration of populations occurred in northern Schoolcraft and northeastern Alger Counties. Highway plantings were heavily infested at points along U. S. 2 in Schoolcraft and Chippewa Counties and along U.S. 31 in Emmet County. In Wisconsin, there was an increase of this pest over

most of the state. Tree mortality occurred in plantations of small jack pine. The insect was reported to be very abundant in Sauk, Sawyer, Juneau, Portage, and Eau Claire Counties. Reports of defoliation of jack pine were received from scattered locations in Minnesota.

European Pine Sawfly - Neodiprion sertifer (Geoff.)

There was a general increase in the over-all populations of this sawfly in pine Christmas tree plantations in the Lower Peninsula with the heaviest injury occurring in Ingham County. Examinations of the areas treated in 1952 showed no hold-over of the virus. No additional treatments using the virus disease were carried out in 1953. The areas that were treated in Illinois in 1952, using the same virus, showed a hold-over when checked in 1953. The disease had spread naturally two chains out from the edge of the sprayed areas.

Introduced Pine Sawfly - Diprion similis (Htg.)

In Wisconsin, the range of this pest increased slightly, but there was an appreciable decline in populations within this range. The infestations in 1953 occurred on white pine in seventeen of the western counties. Light to heavy injury was reported from various areas in Minnesota.

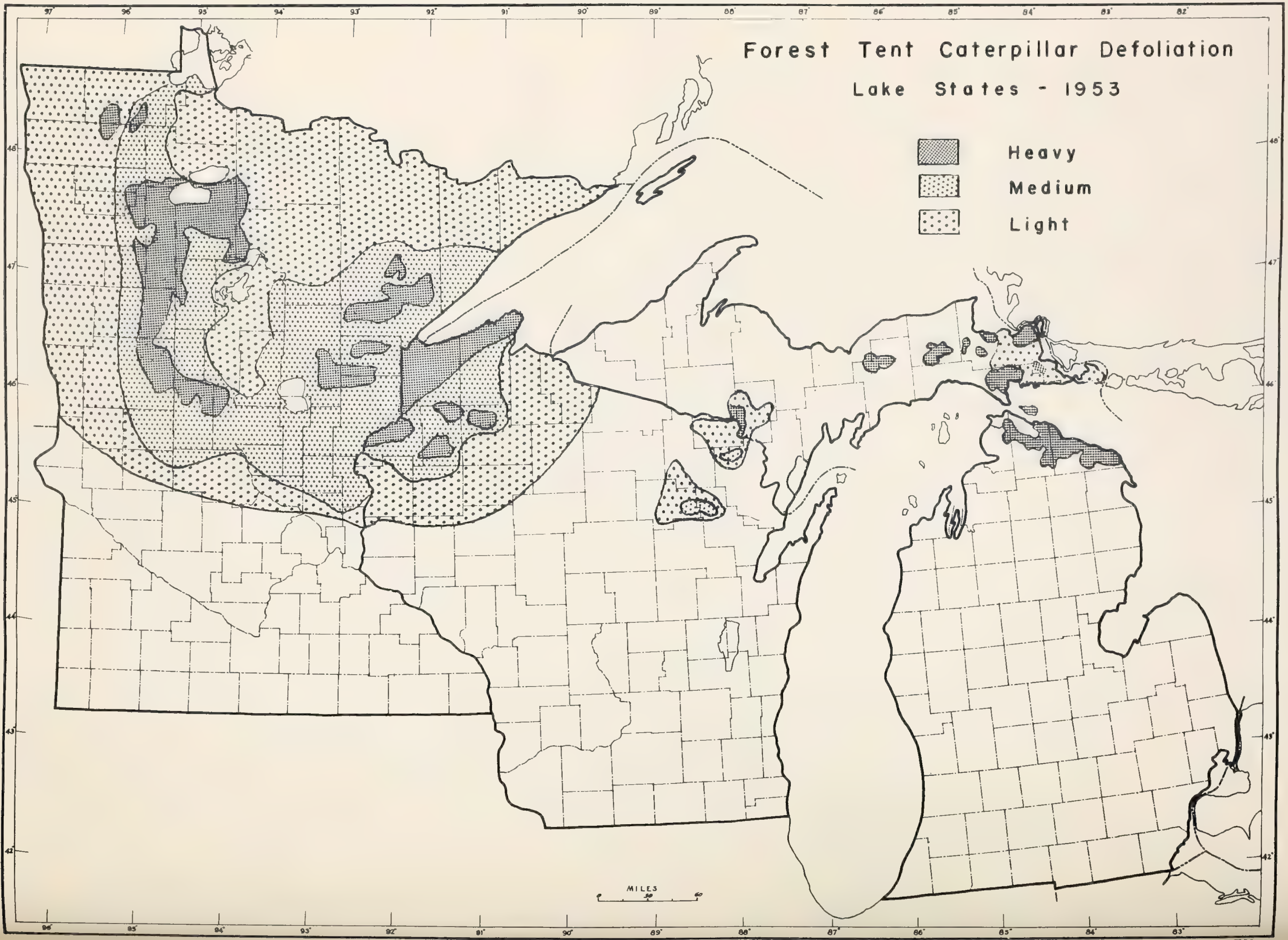
Populations of four other pine sawflies - Neodiprion americanum banksianae Roh., N. swainei (Midd.), N. nanulus Schedl., and N. pinetum (Norton) increased in Wisconsin but were of local importance only. N. pinetum was also recorded from Minnesota.

FOREST TENT CATERPILLAR - Malacosoma disstria (Hbn.)

Defoliation by the forest tent caterpillar continued in many areas throughout the Lake States. Minnesota again suffered defoliation over a larger area than either Wisconsin or Michigan. Prolonged cold weather in the spring, just after hatching, prevented normal feeding and resulted in a decline in the intensity of the outbreak. The areas of heavy defoliation have moved outward from the center of the 1952 infestation. The Mesabi Iron Range forms a striking boundary between defoliated and undefoliated areas. Heavy defoliation occurred in St. Louis, Carlton, Aitkin, Roseau, Pennington, Red Lake, Clearwater, Beltrami, Mahnomen, Hubbard, Becker, Ottertail, Todd, and Crow Wing Counties.

Based on egg mass surveys carried out in 1953, it is possible that 1954 will be the last year of heavy defoliation in Minnesota during the present outbreak. These surveys indicate that the infestation will be less severe than at any time since 1951 and moderate to heavy defoliation will be limited to an area encompassing approximately 6 1/2 million acres, compared to 11 million and 26 million in 1952 and 1953, respectively. This defoliation can be expected in the southwest tip of Cook County, the south half of Lake County, the southeast third of St. Louis County, the southeast half of Aitkin County and all of Carlton, Pine, Kanabec, Isanti, and Chisago Counties, and portions of Beltrami, Koochiching, Itasca, Becker, Ottertail, and Wadena Counties.

In Wisconsin, the northwestern part of the state was the major area of defoliation. Complete defoliation occurred in most of Douglas and the upper part of Bayfield Counties. Parts of Burnett, Washburn, and Sawyer Counties were

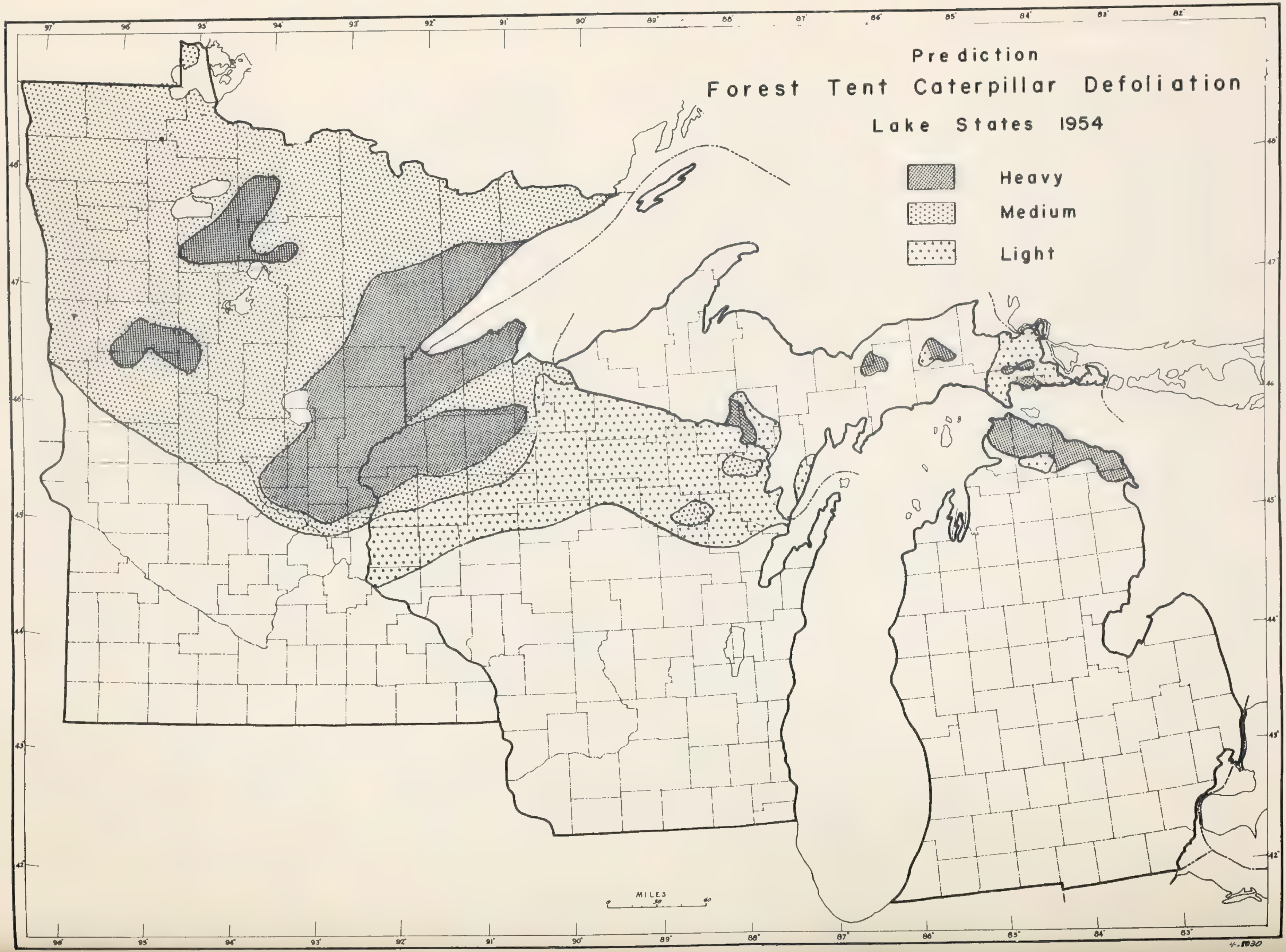


Forest Tent Caterpillar Defoliation

Lake States - 1953

U.S.D.A. - S.C.S. Milwaukee, Wis., 1952

4-1830



Prediction
Forest Tent Caterpillar Defoliation
Lake States 1954

4-1030

U.S.D.A. - S.C.S. Milwaukee, Wis., 1952

lightly infested. Private landowners had aerial spraying done on their land in parts of these counties during May and June. Centers of infestation were also found in Chippewa, Rusk, Forest, and Marinette Counties. Approximately 1,000 acres of aspen type suffered some degree of defoliation on Forest Service land in Oconto County.

In general, defoliation in the eastern end of the Upper Peninsula of Michigan was much less than in 1952. The outbreaks in the remainder of the Upper Peninsula increased slightly in intensity, especially in Dickinson County. The outbreak in Emmet, Cheboygan and Presque Isle Counties of the Lower Peninsula increased in severity. Cocoon samples from both peninsulas showed a cocoon mortality of 89.2 and 84.2 for the Upper and Lower Peninsulas respectively. However, it is predicted that approximately the same area will suffer moderate to heavy defoliation in 1954.

WALKINGSTICK - Diapheromera femorata (Say.)

The walkingstick was present in Minnesota in most of the same localities as in 1951. However, heavy defoliation was found only in hardwood stands south of Pillager in Morrison County. Because of the low temperatures that occurred during the early part of the summer, defoliation was not anticipated and did not develop. In Wisconsin heavy to moderate defoliations were reported locally in several counties. Approximately, 1,000 acres on the Menominee Indian Reservation suffered defoliation, with 200 being heavily defoliated. Egg surveys to determine needs for treatment will be made in the summer of 1954. The insect was also abundant on Rib Mountain in Marathon County.

LARCH CASEBEARER - Coleophora laricella (Hbn.)

The larch casebearer was again present throughout the range of its host in Wisconsin, but there was a very noticeable decrease in the northeast quarter of the state and a lesser decrease in other parts. In Michigan, there was a decline in infestation of approximately 30 percent throughout the state. Many areas suffering defoliation in 1952 were devoid of injury during 1953. Heaviest defoliation was found locally in Schoolcraft, Dickinson, and Kalkaska Counties. Observations also indicate heavier feeding in the Lower Peninsula than has occurred in previous years. The casebearer was also reported present in the Floodwood area of Minnesota.

WHITE-PINE WEEVIL - Pissodes strobi (Peck)

This insect occurred scattered throughout the Lake States, but damage was generally low except in localized areas. However, the weevil is one of the most harmful insects affecting immature pine stands and for this reason should be kept under close surveillance. In Michigan, the population declined slightly in 1953, but the weevil was still very common throughout all but the extreme southeastern and south-central parts of the Lower Peninsula. Weeviling was heavy in the highly susceptible stands. More than 60 percent of the terminals were attacked in local areas of Dickinson, Mackinac, Emmet, Otsego, Lapeer, and Allegan Counties. These attacks were on white, jack and Scotch pines. A single report of weevil attack on red pine came from each of two counties, Emmet and Wexford. Red pine was also attacked in plantations on the Nicolet National Forest in Wisconsin. High populations of the white-pine weevil can be found in many counties of Wisconsin in open grown white pine and Norway spruce and poorly-stocked stands of jack pine. Light infestations were reported from Minnesota.

SARATOGA SPITTLEBUG - Aphrophora saratogensis (Fitch)

This species of spittlebug has caused severe damage to red pine and jack pine plantations in the Lake States since its discovery in 1941. Beginning in 1952, control estimates have been based upon a feeding-puncture survey in the fall and a nymphal survey in the spring. The 1952 fall survey indicated a need for spraying 12,000 acres on National Forest land in Wisconsin and the Upper Peninsula of Michigan. Based on the spring survey, 11,280 acres were actually sprayed. This acreage included most of the 12,000 acres originally planned, although some areas were eliminated and others added as a result of the spring survey. The degree of control varied because of certain conditions; heavy rains two hours after spraying and poor coverage reduced the amount of control in some areas.

The fall feeding-puncture survey conducted in 1953 indicated a general increase in feeding on those areas surveyed in 1952 but not sprayed because of the low population at that time. Based on the 1953 survey, the Forest Service has requested funds to spray 14,450 acres during 1954. Approximately, 11,000 acres are open plantations and the remainder are under an overstory, chiefly aspen. Release priorities of these latter plantations have been established based on entomological, silvicultural, and economic considerations. It is expected that most of these areas will be released before July 1954.

Destructive populations were also reported from state lands, but accurate details on acreage are not known. In Michigan, the greatest populations are centered in the western part of the Upper Peninsula. In the Lower Peninsula, there is a scattered distribution throughout the northern half with the largest populations in Presque Isle County.

EUROPEAN PINE SHOOT MOTH - Rhyaciona buoliana (Schiff.)

Injury by this pest increased during 1953. In Wisconsin, infestations were heavy in Milwaukee, Waukesha, and Sheboygan Counties. In the Milwaukee area it was very common on ornamental pines. In Michigan, there is a uniform spread of populations with heavy injury occurring only locally. There is a serious outbreak in Benzie and Grand Traverse Counties. This is 60 miles farther north than the limits of the infestation in 1952. Apparently, the warming influence of Lake Michigan and the moderate temperatures of the last two winters have made the northern spread possible.

BIRCH LEAF SKELETONIZER - Bucculatrix canadensisella Chamb.

A general epidemic of this insect occurred late in the season throughout Wisconsin and Michigan. Defoliation was very heavy in Dickinson, Charlevoix, Antrim, and Grand Traverse Counties in Michigan. This insect is not too harmful because the defoliation occurs late in the season after growth has been completed. Continued infestations by this insect may predispose stands to secondary attack by the bronze birch borer.

PINE SPITTLEBUG - Aphrophora parallela (Say.)

This insect was present throughout Michigan and Wisconsin, but very little damage resulted. Heaviest apparent injury was on Scotch pine in Muskegon County, Michigan.

ANOMALA BEETLE OR PINE CHAFER - Anomala oblivia Horn

In Michigan, the overall population of this insect declined slightly, but feeding injury was more severe than in 1952. Up to 100 percent defoliation of both new and old foliage occurred in certain jack pine stands in Kalkaska, Benzie, Grand Traverse and Montmorency Counties. Light feeding on red pine occurred in these areas also. The insect has not been reported from the Upper Peninsula.

EASTERN TENT CATERPILLAR - Malacosoma americana (F.)

This insect was present throughout the Lake States. Although defoliation remained heavy, populations declined throughout the Lower Peninsula. Most of the damage occurred on shade and orchard trees.

PINE TORTOISE SCALE - Toumeyella numismaticum (Pettit and McD.)

Heavy infestations of this insect occurred locally. It was very prevalent on the Rapid River Ranger District of the Hiawatha National Forest in Upper Michigan. In Wisconsin, local infestations occurred in Marinette, Florence, and Oconto Counties. Some tree mortality was observed in Oconto County.

LARGE ASPEN TORTRIX - Archips conflictana (Wlkr.)

This insect has greatly increased in numbers during the past year in Michigan. It occurred in the same stands as the forest tent caterpillar, but appeared most serious in the eastern part of Dickinson County and adjacent Menominee County. In 1953, local pockets, 10 acres in size or larger, suffered 90 percent defoliation.

OTHER INSECTS

The locust borer, Megacyllene robiniae (Forst.) was moderately abundant in Wisconsin, particularly in the southern part of the state.

Defoliation by the walnut caterpillar, Datana integerrima G.&R., was reported to be very prevalent in southern Wisconsin.

Pine bark beetles, chiefly Pityogenes hopkinsi Sw., and Ips pini (Say.) were reported to have attacked drought-injured white pine in large numbers in Wisconsin. Sanitation measures were undertaken where there was danger of populations spilling over to attack healthy trees.

A constant surveillance should be maintained for insects that, although presently in endemic status in the Lake States, can become serious forest pests. Among these are: Spruce budworm, Choristoneura fumiferana (Clem.): black-headed budworm, Acleris variana (Fern.); hemlock looper, Lambdina fiscellaria (Guen.); bronze birch borer, Agrilus anxius Gory; hemlock borer, Melanophila fulvoguttata (Harr.); poplar borer, Saperda calcarata Say; and pine bark beetles of the genera Dendroctonus and Ips.